

## ATTENDANCE

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## **Appendix G**

### **UltraTec's Brochure, *Cellular TTY Calling***

# CELLULAR TTY CALLING

You can use the EZcom Pro™ to make and answer cellular TTY calls. Using cellular technology allows you to be away from your home or office and keep your access to the telephone.

In order to use the EZcom Pro with cellular technology, you need the correct equipment:

- **RJ11 compatible intelligent interface (data converter)** allows you to use the cellular network for your TTY conversations.
- **Cellular telephone (analog)** with an external connector that is compatible with the intelligent interface cable. The external connector allows you to plug the RJ11 intelligent interface cable into your cellular telephone.

## Where can you get this equipment?

You can find the equipment that you need at your cellular telephone provider. They have the equipment you need or they can order it for you. Prices will vary depending on the type of cellular telephone you select.

Bring the EZcom Pro and this guide to your cellular provider when you want to start using the cellular network. The guide will help your cellular provider find the correct equipment. See *For the cellular telephone provider* on the back page for more information.

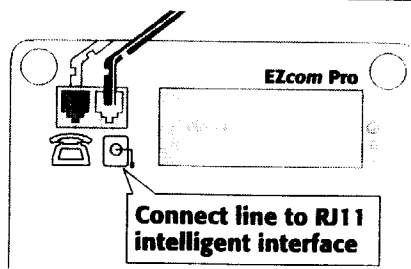
Also, this guide will help you make practice calls to ensure that the equipment works properly before you buy it.

## Setting up the EZcom Pro with a cellular telephone

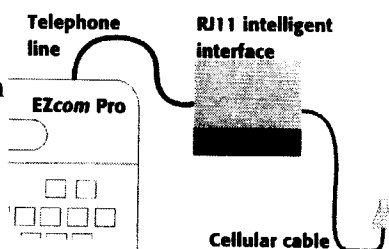
Before you set up, make sure that the EZcom Pro, the RJ11 intelligent interface, and the cellular telephone have batteries installed. Check each device's instruction manual for more information.

The following procedure describes the basic set up with most brands of cellular equipment.

1. Plug one end of a telephone line into one of the jacks on the bottom of the EZcom Pro.

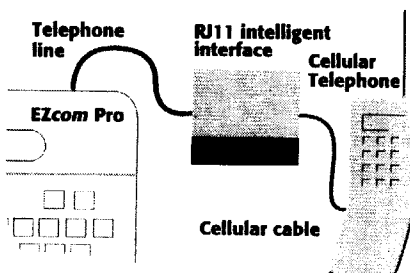


2. Plug the other end of the telephone line into the jack on the RJ11 intelligent interface.



3. Plug the cellular cable into the cellular telephone's external connector.

**Note:** The equipment depends on your cellular telephone type. This setup may look slightly different from the setup you will use.



## Making a cellular TTY call

Because cellular technology uses frequencies (like radio waves) to transmit information, make sure that you are in your cellular calling region and in a location that allows for good transmission and reception. Contact your cellular provider for more information.

To make a TTY call, do the following:

1. Turn on the RJ11 intelligent interface.
2. Turn on the cellular telephone.  
Make sure that your cellular telephone has established a signal for calling. See your cellular telephone's instruction manual for more information.
3. Press the **Dial** key on the EZcom Pro.
4. Dial the telephone number using the number keys on the EZcom Pro keyboard.
5. Wait for a greeting message.
6. When you see a greeting, begin your conversation.
7. When your conversation is finished, turn off the EZcom Pro, the RJ11 intelligent interface, and the cellular telephone.

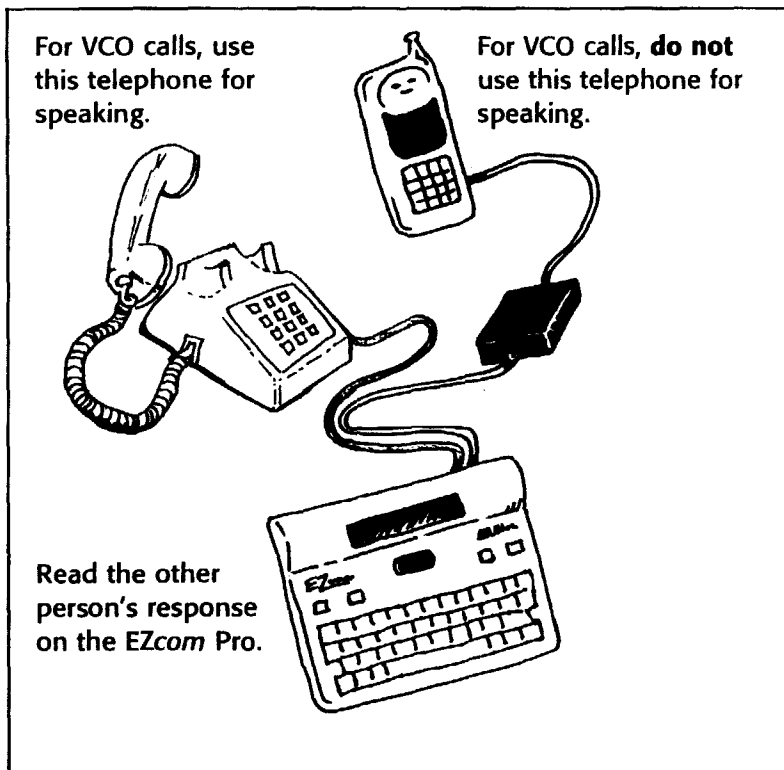
**Note:** The procedure that you use to make a call may vary depending on your cellular telephone.

## Voice Carry Over (VCO) users

Due to limitations of cellular technology, the cellular telephone cannot be used for both voice and text at the same time. In order to use VCO, you need to connect a separate standard telephone to the second jack on the bottom of the EZcom Pro. Use this telephone when you want to speak to the other person.

If you try to talk to the other person using the cellular telephone after you have begun a text conversation, the other person will not hear you speaking.

Below is an example of the cellular set up used for making VCO calls. This example is for illustrative purposes only. Depending on your cellular telephone type, the set up you use may be slightly different. In addition, you may choose a more compact portable telephone.



## Answering a cellular TTY call

Cellular telephones must be turned on before they are able to receive a call. For options on knowing when you are receiving a call, contact your cellular telephone provider. These options may vary depending on the cellular telephone that you own.

1. The cellular telephone "rings," signaling that you have an incoming call.
2. Turn on the RJ11 intelligent interface.
3. Answer the call as explained in your cellular telephone's instruction manual.
4. Turn on the EZcom Pro and type a greeting.
5. Continue with your conversation.
6. When your conversation is finished, turn off the EZcom Pro, the RJ11 intelligent interface, and the cellular telephone.

**Note:** The procedure that you use to answer a call may vary depending on your cellular telephone.

## Troubleshooting tips

The cellular telephone network is very different than the traditional telephone system. The availability, the costs, and the quality of connections associated with cellular telephones vary from state to state. Even non-TTY callers occasionally have problems with cellular calling.

If you are having trouble connecting or you are disconnected during your conversation, check the following items:

- *I'm having difficulty connecting my call.*

Make sure your cellular telephone is an analog type.

Are the EZcom Pro, RJ11 intelligent interface, and cellular telephone all turned on?

Does each device have power (batteries installed)?

- *My cellular telephone seems to be dialing the telephone number, but I'm not connecting.*

Are you in your cellular calling region?

Did the cellular telephone establish a signal before you dialed the telephone number?

- *After my conversation has begun, I am disconnected with the other person and receive garbled text.*

Are you making a call while moving? For example, are you riding a train, car, bus, etc? If so, you may be losing your cellular connection due to tunnels, hills, or valleys. Try calling the other person again from a location where these items will not interfere with your cellular call.

Contact your cellular provider for more information about these or any other calling difficulties that you may experience.

## For the cellular telephone provider

- The EZcom Pro TTY works like a standard analog telephone, and requires a "dial tone" in order to work with a cellular telephone.
- The cellular telephone must be analog not digital.
- An RJ11 compatible intelligent interface is required in order for the EZcom Pro to send its data (text conversations), along with an appropriate cable to connect the interface to the cellular telephone. The RJ11 intelligent interface is sometimes referred to as a modem, data link, data connector, or a data box.
- The EZcom Pro does not use the PCM or PC modem cards that many laptop computers use.
- While the specific RJ11 intelligent interface will depend on the make and brand of the cellular telephone, the following RJ11 intelligent interfaces have been tested with the EZcom Pro for making and answering TTY calls:

### RJ11 Compatible cellular interfaces

#### Motorola Cellular Connection™

Part #	Cellular telephone type
S1936	Motorola car-mounted and bag-style
S3027	Motorola portable-flip style (Model S3027 may work with other cellular telephone brands if the proper data cable is used.
S4229	Motorola portable-Elite flip style

#### Axcell® Intelligent Interface

Part#	Cellular telephone type
1A02X001	Audiovox 3 watt series V
1A02X002	Motorola Micro TAC series
1A02X003	Motorola 3 watt (series 2, 3, and 4)
1A02X004	Ericsson/GE micro-portable CT700
1A02X005	NEC P700/800 series
1A02X006	Motorola Elite series

**Note to providers:** If you do not carry these parts or if the customer is using a cellular telephone brand that is not compatible with the equipment listed above, please recommend equivalent equipment that provides the same capability.



## **TTY Forum**

# **Seeking Solutions to TTY/TDD Through Wireless Digital Systems TTY/TDD FORUM - 3**

**Draft Report .01**  
(February 18, 1998)

**February 11 - 12, 1998  
TTY Forum - 3  
Gallaudet Univ.**

## Washington, DC

This report will follow the structure of the agenda (included below) and will make the changes in agenda order agreed to and recorded in the opening remarks section. The agenda number will be used to precisely identify topics and will be offered out of numerical order to reflect the order in which each topic was presented during the forum. Several additional headings were added to accurately reflect the discussion topics added during the forum.

## AGENDA

Forum Goal: *Seeking Solutions to TTY/TDD Through Wireless Digital Systems*

9:00 AM

1. Call to Order & Opening Remarks	Co-Chairs, CTIA/PCIA Judy Harkins, Host
2. Introductions and Attendance Roster	
3. Review & Approve TTY Forum - 2 Summary	
4. Review & Approve Agenda	
5. Review TTY Forum 1 and 2 <i>Agreements</i>	Steering Committee
6. Introduction & Numbering of Contributions	
7. TTY Forum Administrative Issues	Steering Committee <sup>1</sup>
8. FCC Report and Order 97-402 - Clarification of December 1, 1998 deadline - Reporting Requirements	Mike Altschul, CTIA
9. WEIAD's Status Report to the FCC	Ed Hall
10. Working Groups	
• Working Group #1/3: Performance of TTY Signals over Voice Services and Coupling	Wesley Howe Doug Neeley, Chairs
• Working Group #2: Performance of TTY Signals over Data Services	Brye Bonner, Chair
1 Consumer Notification Strategy	Laura Ruby
2 FCC Status Report: Structure TTY Section	Steering Committee
3 How to Implement Solutions/Proposals	Open Discussion
4 New Business/Next Steps	Co-Chairs
5 Next Meeting	
6 Adjournment	3:00 PM February 12th

<sup>1</sup> TTY Forum Steering Committee: Toni Dunne; Billy Ragsdale; Claude Stout; Norm Williams; Jeff Crollick, John Melcher

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## **CALL TO ORDER AND OPENING REMARKS**

Co-Chairs Mary Madigan, PCIA and Ed Hall, CTIA, call meeting to order. Judy Harkins, Gallaudet University, welcomed group.

## **INTRODUCTIONS AND ATTENDANCE ROSTER**

Introductions made and attendance roster circulated. Recommendation by co-chair to move Agenda item #4 (Review and Approve Agenda) to follow Agenda item #2. Approved.

## **REVIEW AND APPROVE AGENDA**

Recommendation to move Agenda item #11, Consumer Notification Strategy, to follow #8, FCC Report and Order 97-402.

Change approved, Agenda approved as amended.

## **REVIEW AND APPROVE TTY FORUM - 2 SUMMARY**

Comments have been collected and changes made to report. Call for additional comments. No comments presented, chair moved to accept TTY Forum - 2 Summary. Report accepted. Recommendation made to separate the page of "Agreements Reached" from body of the report, making it an on-going page attached to succeeding reports allowing agreements to be added or changed by subsequent meetings. Report will note meeting at which additions and changes were made.

## **REVIEW TTY 1 AND 2 AGREEMENTS**

*(Note: An "Agreements" page will be attached as an Appendix to all TTY Forum Reports and will provide an on-going record of agreements reached and changes to existing agreements.)*

Verify agreement:

- Short term solution - through vocoder
- Long term solution - possibly excludes sending BAUDOT tones through vocoder

Only the TTY Forum may change agreements reached by this body.

Call for comments. Hearing none, agreements are accepted.

New Additions to Agreements Page (see Appendix A for complete list of TTY Forum Agreements):

- 6 sponsored spots for identified consumer groups, relinquished if member misses 2 consecutive meetings.
- Accept modified "readability test" to be used by phone manufacturers to benchmark TTY over digital capabilities, to determine success rate for transport. (See Contribution TTY/98.02.11.06) Two tests: Manufacturers Readability Test, End User Test
- Error rate is defined as "character" not "bit" for the purpose of this forum. (Shift error rate of ratio 1/8 (i.e. 1 shift error causes up to eight text errors and will be counted as such) to be determined)

- Develop User Requirements Document. The outcome of Working Group #2. Represents the effort to provide for future advancements in technology by looking at solutions beyond 45.45 baud, Baudot.
- Define process to update Notification Document: refer updated information to CTIA to be distributed to T-CAT.

## **INTRODUCTION AND NUMBERING OF CONTRIBUTIONS**

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Call for contributions.

Numbering	Name of Contribution	(Agenda Topic #)
TTY/98.02.11.01	- Agenda	(01)
TTY/98.02.11.02	- TTY Forum - 2 Report	(02)
TTY/98.02.11.03	- Proposed Draft Text - TTYs and Wireless Phones	(11)
TTY/98.02.11.04	- Proposed E911 TTY/Digital Notification Strategy	(11)
TTY/98.02.11.05	- Ericsson Contribution	(10)
TTY/98.02.11.06	- Joint Task Force Working Group #1/3	(10)
TTY/98.02.11.07	- Ericsson - E9-1-1, TDD Compatibility to GSM	(10)
TTY/98.02.11.08	- Roster	
TTY/98.02.11.09	- FCC E9-1-1 Reconsideration Order FCC 97-402 (Note: Change made to reporting date - July 10, 1998 <i>not</i> June 10, 1998 as written)	
TTY/98.02.11.10	- Real Life Test Pattern	

## **TTY FORUM ADMINISTRATIVE ISSUES**

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Steering committee reviewed slots:

- 1 - SHHH
- 1 - Gallaudet University
- 1 - TDI
- 1 - ASHA
- 1 - NAD
- 1 - CAN

Slot assignments approved, contingent on whether ASHA wants their slot. If they do not want slot, their name will be dropped. The Wireless Industry will pay the meeting cost for the attendance of the above six members (five members, if ASHA drops out).

Proposed Rule: If organization does not send a representative for two consecutive meetings, the subsidized slot will be forfeited. The group will not be excluded, just will lose their funding (may petition for reassignment of slot).

Discussion:

- Karen Peltz-Straus, NAD, reported that ASHA may not want their slot, will just want to be informed. Recommends that groups not able to attend will give their proxy to another group and retain slots. Must maintain cognizance with issues.
- Billy Ragsdale, Steering Committee, clarified that the issue with loss of slots is that members who don't attend meetings can be disruptive if they don't keep up with issues. Perhaps the rule could be made less stringent but the issue recognized.

- John Melcher, Steering Committee, recommended that all meetings be held in Washington DC to accommodate needs of consumer organizations and ensure their ability to attend.
  - Ed Hall, co-chair, stated that copies of the TTY Forum report are available to all at no cost. Information will be sent to all who request it.
- Vote taken, one opposed. Rule is accepted.

## **FCC REPORT AND ORDER 97-402**

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### **Overview of Major Provisions:**

- Analog in effect 12/1/97
- Digital enforcement suspended to 10/1/98
- Notification Requirements
- Reporting Requirements
- FCC's Wireless Telecommunications Bureau authority to extend compliance date to January 1, 1999, if necessary. Decision based on quarterly reports.
- Functional equivalents
- Phase I and Phase II E9-1-1 Requirements and Implementation Dates.

### **What does it mean?**

- Commercial availability - Goal is operational by 10/1/98 all digital wireless systems have reliable and compatible TTY so PSAP and TTY user can easily communicate]
- Extent of availability - all digital
- Phased approach - Default to analog of compatible available for one type of digital - focus on having all systems operable

### **Notification Requirements**

- wireless carriers whose systems are not compatible
- reasonable efforts to notify current and potential subscribers
- Message - TTY users will not be able to use TTYs to call 911 with digital
- FCC encourages w carriers to work with a TTY and (4 stakeholders) with respect to notification

Duration: Until compatibility problem solved. Order silent as to objective criteria as to acceptable error/compatibility

### **Reporting requirements**

April 10

July 10

Oct 10

- Purpose of status reports
  - Monitor, encourage, ensure progress of the TTY Forum
  - Condition for suspension of enforcement of TTY requirement
  - Foundation for any future requests to FCC for further extension of compliance date

- Content of Status reports
  - Information regarding the problems associated with TTY access through digital wireless systems
  - proposed technical solutions
  - steps taken to achieve proposed technical solutions'
  - steps taken to notify current and potential subscribers
  - sufficiently detailed to assess progress
- Signatories to consensus agreement responsible for filing quarterly status reports
  - CTIA, PCIA, NAD, Gallaudet, TDI, CAN
  - Recommendation: TTY Forum Reports as basis for quarterly status reports

#### Functional Equivalents

##### FCC Determination in E9-1-1 Reconsider Order:

- Digital wireless carriers cannot rely on "functional equivalents" such as short-messaging text or data services compliant with international standards to meet obligations under TTY requirements
- Not appropriate or practical alternative for hearing and speech impaired persons in an emergency
- Such "functional equivalents" currently are little or no benefit to TTY user in an emergency , because few PSAPs are configured to accept short messaging services directly and not all PSAPs can accept ASCII type TTY calls and other types of data calls.

Discussion: In agreements reviewed this morning - refer to short and long term solutions -

##### Phase I and II requirements

- Phase 1 and 2 including the implementation dates apply to TTY calls, except Phase 1 requirements for TTY calls through digital wireless systems are deferred until 10/1/98

##### Phase 1 Implementation Date:

Analog Wireless systems April 1, 1998

Digital – October 1, 1998

- Phase 2 Implementation Date : Location for analog and digital wireless systems – October 1, 2001

## CONSUMER NOTIFICATION STRATEGY

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### *Summary:*

*Discussion centered on defining who must be notified, how to reach them, and what the information a Notification Letter should contain. The Notification Strategy Chart (Contribution WEIAD/98.02.11.04), analyzing the type of customer, possible methods of notification, messenger(s), and target delivery*

*date, was presented. A working group was formed to provide a proposed Notification letter to the group. Notification Letter was discussed day 2 and approved with modifications. Approved Notification Letter is included as Appendix B.*

Laura Ruby, AWS, chair, presented the Notification Strategy Report. Message must be consistent to avoid confusing customers. Contribution WEIAD/98.02.11.04 - Notifications Strategy Chart - identifies customer type, possible methods of notification, messengers, target delivery date. Most customers are unaware of TTY and requirements and may have relative or friend who can use information. Most current customers using TTY have been in close communications with carriers/manufacturers. In some situations the carriers need help from manufacturers and consumer groups to reach consumers who are not in contact with service providers. Add the notification message to booths at Trade Shows, etc. TTY manufacturers are a key to the notification by identifying what the device can and cannot do.

Comments:

- Recommendation from CAN: Carriers must provide individual notification to all potential users, including researching to identify all deaf and hard-of-hearing persons, via mail.
- Only those who are potential customers need to be notified, not all people.
- Those making a decision may need information prior to purchase.
- Potential users need to do the research and be supported by their consumer groups
- Industry could notify consumer groups to get notification into their publications and meetings. Consumer groups need to take some responsibility and help wireless industry to ensure notification. There are cost related issues that cannot be discounted and groups need to work together to accomplish goal.
- Cooperation among groups is required to produce widely available notification, i.e. through websites, using the consistent, agreed-to format.
- Offer of help from equipment distributors, who distribute equipment for free.
- Carriers bear the responsibility for notification therefore burden of expense is on carriers to pay for all notification.
- Carriers are looking for wording from TTY Forum.
- Notification work effort is most important work from this meeting. Carriers feel sense of urgency to provide to carriers for immediate implementation.
- Problem with arriving at a consistent message in the next day is that the correct information is not necessarily known at this time.
- Can this group work on the message without having a process to disseminate information?
- Reason for this notification effort is to protect the consumer from making a bad purchase. This group should not expand the FCC requirement beyond what the intent was.
- Consensus on action team to be created to work on wording to report back to group. Request representation from all groups.
- TTY manufacturers are not represented at this meeting - Ameriphone, Krown,



and Ultratec.

Additional requirements have been set:

- Provide status report quarterly
- Consumer notification - requires an action team with large support group from consumer groups and with careful focus and agreement on content of notification message.

Effort for consensus on wording for Notification Message to be used by The Customer Awareness Team in producing their contribution.

Essential points:

- Background on TTY and technology issues.
- Reference to timeframe of information to ensure up-to-date information is shared
- Focus on TTY access. Groups could adapt message to accommodate special needs. Providers will work with groups to ensure accurate information.
- Analog section is controversial since some carriers cannot provide the analog fallback.
- What is commercially available solution for digital today - not what is technically possible.
- RJ-11 interface has not been proven. Acoustic coupling was proven for all phones at last TTY Forum.
- Identify whether dual mode phones can be locked into analog mode for duration of TTY calls.
- PCS is digital and has achieved adequate delivery of messages over TTY.
- CDMA/TDMA not proven.
- Need to provide generic message applicable to all technologies represented today.
- Message needs to be as clear to lay population as possible. Break message into technology and effect on TTY.
- Be careful to use universal terms so that deaf person can go to store and ask for "one of these" and have clerk understand terms.

### **WEIAD STATUS REPORT TO FCC**

The WEIAD Status Report was delivered to the FCC on January 29, 1998. Anyone interested in a copy of the report can call Ed Hall at CTIA.

### **WORKING GROUP #1/3**

*Summary:*

*A contribution of text to use as an objective test of TTY over the air interface was presented. Test was accepted as modified by the addition of scenario-based text. Requirement was identified to develop a second, subjective, test. A working group, chaired by Toni Dunne, was formed to prepare a contribution of a subjective test to be presented at the next TTY Forum. Discussion centered on defining acceptable error rate, proper testing, and satisfying the FCC*

*requirements. Contribution WEIAD/98.02.11.06 and Contribution WEIAD/98.02.11.07 were presented to amplify the discussions of error rate measurement, lab testing, and potential solutions.*

Wesley Howe, GTE Wireless, co-chair presented the Working Group #1/3 report. Established performance criteria with subset of a text message and established acceptable error rate. Group will provide consensus opinion to acceptability of testing and error rate.

Used 72 characters per line to eliminate carriage return as a variable. Specify inter-character delay pre-determined. Error rate is calculated on characters. Over 2500 characters included in test. Is the shift character characteristic of Baudot included in the test? No. The character sets are randomly set to include a lot of character transitions. The shift character rate is significant because the shift key error will cause the next character to be erroneously transmitted.

Comments:

- Noted that the recommended process at TTY Forum-2 was an actual example of an interactive 9-1-1 call script.
- Concern: ASCII output to the modem is not Baudot. We cannot simulate shifting here. Recommend using Baudot output to modem to more accurately simulate a real situation.
- Response from Group 1/3: Conferred with manufacturer who said equipment translates.
- Error rate even in highly trained PSAP call takers very high. Is it possible to reach consensus on error rate?
- Need to agree on some baseline to work from.
- Take Phased approach - get ballpark of examples of error rate 1% through 50% to try to establish consensus on acceptable error rate. Then ask questions of user and introducing increasing level of error to establish where limit of understanding is as related to error rate.
- Test must be able to be replicated. By making a recording of the test, the results are consistent over all systems and technologies.
- Tests in lab may not reflect field results. Human error adds dimension not considered by random, taped tests.
- User research determines the criterion. Group 1/3 presented a way to determine error and the user determines if it's acceptable.
- Establish technical criteria, based on each company's evaluation of proper testing of equipment.
- Do both - use proposed test and then test by individual company criteria then bring tests back as information to group.
- Proposal to accept test.
- Artificial errors could exist in all calls.
- Proposed test is simple and no way to know what may affect test.
- Manufacturers need something valuable to test.
- Incorporate Toni Dunne's scenario-based text based on actual PSAP calls.

NOTICE: For use by members of TTY only. Not for public distribution.

- Accept contribution as modified with scenario-based text.
- Discussion on error rate:
- Accept analog error rate at a PSAP to establish baseline.
- 9-1-1 trunks are engineered to a P.01 standard. The error rate will change based on caller, call taker and situation.
- 45.45 has always been sent via a voice path.

MODIFIED CONTRIBUTION ACCEPTED.

**Discussion on Contribution TTY/98.02.11.06** (presented by Christopher Kingdon, Ericsson):

- Analog phones have an acceptable error rate - about 1% - 3%
  - All domestic CDMA passes at 13kb - should work for TTY.
  - Norman Williams provided test that showed that digital passed at an unacceptable rate. Need to do comparison of phones and digital technologies.
  - Automated attendant at larger PSAPs to place call in queue is a problem to TTY.
  - Question is when do you have a good electrical interface.
  - Discussion on bit error rate vs. Character rate. Baudot is an analog protocol while bit error rate implies a digital protocol. Bit error rate implies error correction, character error rate relates to the test form.
  - *Shift errors could impact the characters to next shift or end of the line. Error in transmission of shift could impact stream. Hitting the shift key will reset the next letters. PSAP operators are trained to hit space bar to correct garbled text.*
  - 2.5 mm jack for hands free adapters gives easiest connection.
- Vocoders used were the same; one just has more error correction.

Discussion on error rate:

Manufacturers cannot be held accountable for errors in the TTY protocol. Therefore, shift errors should only be counted as one air interface error. The additional errors are the problem of the TTY protocol. Manufacturers are responsible for providing acceptable interface for Internet, fax, modem, and have done so.

Error rates that are tolerable in other interfaces are small. The acceptable rates for the real world will be different from what engineers are accustomed to in fax, modems, etc.

**Discussion on Contribution TTY/98.02.11.07**(presented by Christopher Kingdon and David Fitzpatrick, Ericsson):

Ericsson included detail of lab report on PCS 1900 trials to answer questions from group regarding details of the Ericsson contribution at TTY-2.

In practice, a large percentage of phones are EFR and will be totally EFR in near future. The EFR vocoder performs at a lower error rate. Advancing technology has caused an improvement. It is not yet clear whether the error rate is acceptable but the errors are minimal. Big issue that remains is connection

between phone and TTY device. Ensure that there are a variety of price ranges available in the acceptable equipment. Some manufacturers of GSM equipment are prepared to negotiate with TTY manufacturers to provide interface. Vision includes an interface box to allow general compatibility. Will require some kind of conversion with a 2.5mm jack between phone and TTY device.

Aim for satisfying the requirements of FCC and then look to future to satisfy technology needed. TTY machines will have to be modified with jack and disable switch that activates acoustic coupler. Handset presented in TTY-2 will solve for embedded base. Shielding may be required to newer units. Manufacturers will need to focus on interface devices. Good market for entrepreneurs and forum does not want to impede any efforts in that area.

How do we determine a "reliable and compatible" TTY for effective PSAP communication?

- Benchmark text for manufacturers
- qualify error rate ("shift" error must be determined)
- true to life test script

Determine what can be done by Oct 1, 1998.

- acoustic coupler
- direct connect - but requires external battery, connection with phone and therefore adaptation for each manufacturer.

Use the handset as auto-jack, then pass audio to TTY.

If TTY just supplies dry audio - no intelligence, minimum requirement is two wires. Need Ultratec or TTY manufacturers to provide input/output specs and do they require voltage, ring, etc.

Manufacturers will meet with head of Ultratec to try to facilitate discussion under auspices of TIA. No standard to building the phone except four wire colors.

Question to group:

Is the TTY support issue solved if a WSP provides at least one digital phone model capable of TTY? By 10/1/98.

Comments:

- FCC must answer. But FCC will want to know if it's acceptable to consumer groups.
- Turn question around - Will all phones support TTY? NO. Some future phones may not be structured to allow interface of any kind due to small size or specific shape.

## **DAY 2**

### **REPORT OF THE TTY CUSTOMER AWARENESS TEAM (T-CAT)**

*(Note: Notification Letter as modified and accepted by TTY-3 is attached as Appendix B)*

Proposed Text in draft form was discussed. Intended to be simple and direct to assist users who are unfamiliar with wireless phones. Discussion of correct

adjectives to precisely define wireless phones as distinct from cordless or remote wireline handsets.

Discussion of availability of analog and digital adapters to identify whether any phones actually can send TTY today. Analog phones can provide TTY via several small handsets, and older models. Digital interface could be available shortly from Ericsson.

Distribution method is suggested by FCC but not mandated. Mandate is to provide notification.

Agreement to accept Notification Document as modified.

## **REPORT OF WORKING GROUP #2**

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### *Summary:*

*Proposal presented to direct Working Group #2 to focus their long term efforts on future technology such as Personal Assist Devices to allow the solutions to take advantage of technology innovations. Working Group #2 received approval to begin work on a User Requirements Document for this effort with the caveat that they produce a more detailed description of their direction for the next meeting. Working Group #2 requested more membership from the Deaf and Hard-of-Hearing group to assist in the development of the User Requirements Document.*

Brye Bonner, Motorola, chair, and John Melcher, Harris County 9-1-1 presented report of Working Group #2.

Long Term effort is to evaluate digital wireless transport and establish benchmark expectations using lab tests.

Need to provide more services to those who need services most. Of the 28 million of hearing and speech impaired, how many are trying to place a 9-1-1 call over phones using a TTY device? Public Service proposal is to provide a Functional Equivalent.

Personal Digital Assist devices can now do both voice and digital 2-way text over wireless. Add one feature to provide an automated formatting interface to allow two way real time communications in Baudot. Interfaces are as cheap or expensive as required by a simple to elegant solution. Eliminate current system of relay that has human error and automate for communications relay without error. Can provide this system by October 1998? Not too optimistic. But can we get two way communications into the hands of the people who need it? A national distribution system could be put in place to put a PDA in the hands of all those who need it regardless of ability to pay. This is not modem pooling. It uses the wireless network, which is deploying faster and providing better nationwide coverage than the RAM modem system. There is an international effort ongoing to establish worldwide data standards. This group could submit requirements to be considered in the process. Recommend preparation of a SDO to submit

requirements to standards making organization to begin process of international standards development.

Request for consensus that this proposal represents the proper course of action for Working Group #2 in their search for a long-term solution.

Working Group #2 direction is approved to begin work on a User Requirements Document with requirement to produce a more detailed description of effort for the next meeting. Working Group #2 requests more membership from the Deaf and Hard-of-Hearing group to assist in the development of User Requirements Document.

### **FCC STATUS REPORT**

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Requirement to report to WEIAD to be included in their report to FCC and to follow reporting requirements of CC 97-402.

### **HOW TO IMPLEMENT SOLUTIONS/PROPOSALS**

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User Performance Test Development

#### **Step 1 - Objective Test**

Objective of test: provide manufacturers with a standard test that will provide a reliable measure of error rate in transmission over an air interface. Use Contribution TTY/98.02.11.10 - Real Life Test Pattern and add scenario-based modifications.

Accepted as modified.

#### **Step 2 - Subjective Test - Chair of Working Group: Toni Dunne**

Objective of test: What is acceptable error rate for end users with consideration that goal is for both parties understand each other.

Nature of test: Real time operation using a standard text. Shift error rate should possibly be calculated separately because of the impact on readability of text.

User community can help determine impact after a shift error - it is averaged in the experience of users to be about 8 characters in a non-emergency situation.

Compare to the missing of a shift to wireline errors and determine if the missed shift is attributable to the air interface.

Pass/Fail determine:

Acceptable error rate

- shift error rate calculated separately

- end user determines the acceptable rate

- landline shift error rate must be considered

- consider testing both end user parties

- recognize that PSAP call takers are trained to verify information (redundancy) to help reduce impact of shift errors

- find expert help in vocoder testing to assist in developing the test

- evaluators of test should include deaf and hard of hearing and PSAP call taker - consider testing both parties both called and caller

Name of Tests:

**Throughput Accuracy Test** (formerly Objective Test or Manufacturer Readability Test) to benchmark and calculate transport error rate.

**Baudot Readability Test/End User Test** (Subjective Test) Official name to be determined.

Test should replicate an end user in a real life situation (simulated in standard written text) and evaluate

## **NEW BUSINESS/NEXT STEPS**

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Questions for CONSENSUS:

Is the TTY support issue advanced if a WSP provides at least one digital phone model capable of TTY? By 10/1/98? Consumer groups say yes, if it includes all features that are available on other phones, is available at best cost, and has access to service on the digital network which seems to have better availability. FCC to address but will ask consumer groups. Question asked: will all phones support TTY? Answer: NO.

Is it acceptable in a dual mode (digital/analog) to have an interface turn off digital mode and enable analog mode only for TTY use if coupler is totally passive and requires no user intervention? Consumer group says not acceptable. Must focus on digital capabilities. CAN says that a digital solution that has features at the lowest price is acceptable. Consumers want to have equal access to what's available to the general public\*.

\*Clarification on comment by CAN received from Al Sonnenstrahl, CAN:

I need to clarify my remark at the end of the previous meeting at Gallaudet University Kellogg Center last week.

I made the comment that should there be one model, it should have all the features at the lowest price. I was referring to one model per manufacturer per technology... not one model per industry.

## **NEXT MEETINGS**

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<b>April 1 and 2, 1998</b>	<b>TTY Forum -4</b>	<b>Wash, DC</b>
<b>May 20 and 21, 1998</b>	<b>TTY Forum - 5</b>	<b>Wash, DC</b>

## **ISSUES FOR NEXT MEETING/ADJOURNMENT**

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1. Can TDMA/CDMA be sent over analog because of lack of confidence in dealing with the vocoder?
2. Remand statement draft re: "*TTY over digital, one phone per wireless service provider (WSP)*" to the steering committee to prepare as contribution to next meeting.

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